

Secondary bacterial infections in children with proved *Mycoplasma pneumoniae*

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Reports of important pulmonary complications, including bronchiectasis, have been reported after *Mycoplasma pneumoniae* infection.¹⁻⁴ Two reports^{5,6} have noted more subtle pulmonary function abnormalities, several years after mycoplasma infection, in children.

Haemophilus influenzae has been implicated as a secondary invader following initial *Mycoplasma pneumoniae* infection in two reports.^{5,7} The complications so far recorded may therefore be manifestations of secondary infection. This report describes five children with proved *Mycoplasma pneumoniae* infection whose illness was prolonged and in whom secondary bacterial infection was possible.

Case reports

The relevant laboratory findings of each case are shown in the table.

Case 1 A previously healthy 4 year old boy presented four months after an initial flu like illness, which had been followed by a chronic cough and physical signs of left lower lobe collapse. A chest radiograph confirmed collapse and consolidation of the left lower lobe and lingular opacity (fig 1). Bronchoscopy showed a generalised tracheobronchitis. Treatment with a prolonged course of amoxycillin and physiotherapy was planned but not adhered to. When he was reviewed six months later he was found to have a cough, finger clubbing, and signs of left lower lobe collapse confirmed by chest radiograph. In view of previous compliance problems the patient was admitted to hospital for three weeks and treated with co-trimoxazole (for *Haemophilus influenzae* resistant to ampicillin) and chest physiotherapy. The chest radiograph on discharge from hospital showed residual opacities in the left medial and lateral basal segments of the lower lobe with dilated peripheral left lower lobe bronchi suggesting bronchiectasis (fig 2). When reviewed four weeks later he had gained three kilograms and his cough and clubbing had resolved. Three months later, however, symptoms had returned. Physical examination showed decreased air entry and crackles at the left base.

Case 2 An 8 year old girl with previously mild episodic asthma presented with a one week history of paroxysmal cough and fever. A chest radiograph showed left lower lobe collapse. Treatment with erythromycin was started. Three weeks later the cough had become productive of

yellow phlegm and the left lower lobe collapse persisted. Bronchoscopy showed no abnormality. Two months later, after continuous treatment with amoxycillin and physiotherapy, she was free from symptoms and abnormal signs and the chest radiograph was normal.

Case 3 A 9 year old boy, previously healthy, presented with a two week history of persistent productive cough. A chest radiograph showed collapse and consolidation of the left lower lobe. He failed to respond to oral erythromycin, subsequent co-trimoxazole, penicillin, and then intravenous erythromycin. Six weeks after the onset of symptoms he was transferred to the Adelaide Children's Hospital. Clinical and radiological features of left lower lobe collapse and consolidation were evident. Appearances at bronchoscopy were normal. One month after starting treatment with amoxycillin he was clinically and radiographically normal.

Case 4 A 6 year old previously healthy girl presented to her family doctor with a three week history of cough and weight loss. A chest radiograph showed right lower lobe collapse and treatment with erythromycin was initiated. Cough and weight loss continued and six weeks after onset of symptoms she was referred to the Adelaide Children's Hospital. Clinical and radiographic features of right lower lobe collapse and consolidation persisted. Bronchoscopic appearances were normal. She received further treatment with amoxycillin after discharge from hospital and four months later was clinically and radiographically normal.

Case 5 A 9 year old girl, who had previously had bronchopneumonia at 2 years of age and one episode of wheezing at three years of age but who had otherwise been completely well, presented with a two month history of cough. She had clinical and radiological signs of right lower lobe consolidation. One week after starting erythromycin partial radiological resolution was noted. Two weeks later the cough became more prominent and clinical and radiological findings indicated further collapse and consolidation of the right lower lobe. Bronchoscopic appearances were normal. Treatment with amoxycillin and physiotherapy had resulted in complete resolution by the time she was reviewed one month later.

All five children had normal results from sweat tests, normal serum immunoglobulin concentrations, and normal results in tests of neutrophil and lymphocyte function. The patients were also screened for other common respiratory viral pathogens and for *Bordetella pertussis*. Only the positive findings have been reported.

Discussion

These five cases demonstrate primary infection with

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Microbiological findings in the five cases

Case No	<i>Mycoplasma</i> CFT	Tracheal aspirate culture	Sputum culture	Other respiratory pathogens	Approximate duration of illness (months)
1	> 1/320	<i>H influenzae</i> <i>Ps aeruginosa</i>	<i>H influenzae</i>	None	Not recovered
2	1/320	<i>H influenzae</i>	<i>H influenzae</i>	RSV and rhinovirus positive nasopharyngeal culture	3
3	> 1/320	Nil significant	<i>H influenzae</i>	None	3
4	> 1/320	<i>H influenzae</i>	Nil significant	Parainfluenza 2 CFT > 1/160	5
5	> 1/320	<i>H influenzae</i>	Nil significant	None	3

CFT—complement fixation titres; RSV—respiratory syncytial virus.

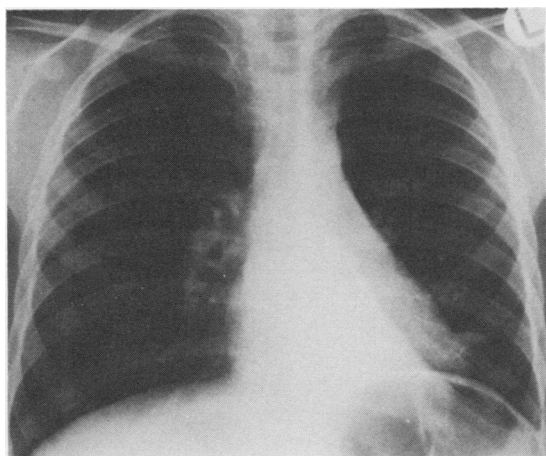


Fig 1 Case 1: Chest radiograph showing collapse of the left lower lobe.



Fig 2 Case 1: Detail of chest radiograph three weeks later showing residual opacities in the left lower lobe and thickened dilated lower lobe bronchi (arrow) suggesting bronchiectasis.

Mycoplasma pneumoniae with probable secondary infection with *Haemophilus influenzae*. Two of the patients also had probable concurrent respiratory viral infections. In four of the five children *Haemophilus influenzae* was cultured from tracheal aspirates taken during bronchoscopy, whereas in one only the sputum was positive. These findings do not amount to conclusive proof of secondary infection but, taken in the context of persistent pneumonia that failed to resolve until appropriate antibiotic treatment was instituted, they support our contention, particularly as it has been shown previously that signs and symptoms of *Mycoplasma pneumoniae* infection usually resolve within four to six weeks.* All five patients had symptoms and radiographic abnormalities for much longer than this.

Mycoplasma pneumoniae penetrates the mucociliary blanket, causing epithelial cell damage and also reduced mucociliary clearance.¹ It may therefore be expected to predispose to secondary bacterial infection more often than previously reported. One study,⁶ in civilians from the Netherlands, found an incidence of secondary *Haemophilus influenzae* infection in 6%. A recent report⁷ of a single patient describes secondary infection with *Haemophilus influenzae* following *Mycoplasma pneumoniae* infection. Another report⁸ noted one patient who developed *Haemophilus influenzae* in sputum during a *Mycoplasma pneumoniae* illness.

One of our patients also developed bronchiectasis, which has been infrequently noted after *Mycoplasma pneumoniae* infection.²⁻⁴ We postulate that in case 1 the initial *Mycoplasma pneumoniae* infection followed by inadequately treated secondary infection led to bronchiectasis, whereas more aggressive management of the other four cases may have prevented bronchiectasis.

In conclusion, we believe that *Mycoplasma pneumoniae* infection can lead to secondary bacterial lower respiratory tract infection, and that if this is not recognised subsequent bronchiectasis or other pulmonary abnormalities may develop.

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